

note that copending application 09/107,729 has been allowed and is scheduled to issue as U.S. Patent 6,270,732 on August 7, 2001. Applicants have anticipated the issuance of the '732 patent and have amended the specification accordingly. Also, a priority claim to copending application 09/107,729 has been added to the application. A supplemental Declaration acknowledging the priority claim will be filed in the near future.

New claims 52-62 are supported by the specification. New claim 52 is supported by the application, for example, at page 16, lines 28-32. New claim 53 is supported by the specification, for example, at page 17, lines 17-33. New claims 54 and 55 are supported by the specification, for example, at page 48, lines 17-18. New claim 56 is supported by the specification, for example, at page 48, lines 25-29. New claim 57 is supported by the specification, for example, at page 48, lines 19-21. New claim 58 is supported by the specification, for example, at page 47, lines 16-20. New claim 59 is supported by the specification, for example, at page 16, lines 30-32. New claim 60 is supported by the specification, for example, at page 48, lines 1-2 and page 49, lines 14-16. New claims 61 and 62 are supported by the specification, for example, at page 48, lines 4-7. No new matter is introduced by this Amendment.

To facilitate evaluation of the reference, a complete translation of the reference JP 61-67836 has been obtained. A copy of this translation is enclosed for reference by the Examiner.

Rejections Under 35 U.S.C. §102(b)

The Examiner rejected claims 20-22 under 35 U.S.C. §102(b) as being anticipated by published Japanese application JP 61-67836 (JP '836 application). Applicants note that a full translation of this reference is included with this Amendment. Applicants believe that there has been a misunderstanding with respect to the scope of the present claim. Applicants respectfully request reconsideration of the rejection based on the following comments.

Further, claim 20 indicates that there are a plurality of reactant inlets and a **single "particle collection apparatus"** (emphasis added) that collects the product particles from the plurality of reactant streams. An embodiment of such a configuration is shown in Applicants' Figures 34 and 35. Thus, the particles synthesized in the **different** reactant streams are collected within the **single** collector. In contrast, the JP '836 application discloses multiple reactant streams, with each reactant stream directed to a **separate collector**, noted 29₁, 29₂, ..., 29_n.

These are shown in Figures 1 and 3 of the JP '836 application. As disclosed in the JP '836 application, each reactant stream in the JP '836 apparatus produces a confined product particle stream that goes to a separate collector. These confined streams are each labeled 28 in the Figs. of JP '836 application. Note that each confined stream remains well separated from the other disclosed streams.

Since the JP '836 application does not disclose multiple reactant streams directing produce particles to a **single "particle collection apparatus"** (emphasis added), the JP '836 application does not anticipate Applicants' claimed invention. Applicants respectfully request withdrawal of the rejection of claims 20-22 under 35 U.S.C. §102(b) as being anticipated by published Japanese application JP 61-67836 (JP '836 application).

Rejections Under 35 U.S.C. §103(a)

The Examiner rejected claims 23-27 under 35 U.S.C. §103(a) as being unpatentable over the JP '836 application. The Examiner asserts that the subject matter would have been obvious to a person of skill in the art because the motivation to make things separable has been held to be obvious. Applicants respectfully request reconsideration of the rejections based on the following comments.

Above, Applicants noted that the JP '836 application does not disclose the collection, with a single "particle collection apparatus," the products of separate reactant streams. As noted in the translation on page 4, the JP '836 application indicates that "According to the present design, gas injection nozzles (25₁) ~ (25_n) and filters (29₁) ~ (29_n) are arranged in pairs side by side." The JP '836 application stresses that the filters and the injection nozzles are positioned in pairs. The JP '836 application does not provide any teaching, suggestion or motivation to use a single "particle collection apparatus" to collect the products from distinct reactant streams.

The Examiner cites In re Dulberg, 129 USPQ 348 (CCPA 1961) for the proposition that it is obvious to make elements separable. This case relates to a cap for a lipstick holder. The court ruled that it would be obvious to make the cap removable to make the portion of the holder accessible. Applicants do not believe that the holding in this case is particularly relevant to the present fact situation.

With respect to the present invention, there is no teaching in the cited art indicating how the apparatus can be modified, and there is no hint of motivation to effect the modification. In

addition, Applicants note that the Examiner has not provided a reference that discloses separation of the reactant streams into separate reactors. If the Examiner is basing the rejection with respect to this feature on his personal knowledge, Applicants respectfully request an affidavit providing the basis of his assertions, as specified in 37 C.F.R. 1.104(d)(2).

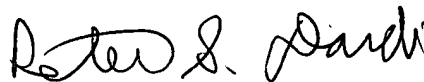
Since the JP '638 application does not teach, suggest or motivate the use of a single "particle collection apparatus" to collect the products from a plurality of reactant streams, the JP '638 application does not render Applicants' claims obvious. Applicants respectfully request withdrawal of the rejection of claims 23-27 under 35 U.S.C. §103(a) as being unpatentable over the JP '836 application.

CONCLUSION

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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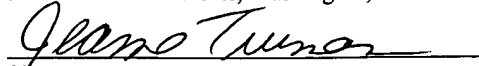
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Jeanne Truman
Name of Person Making Deposit


Signature

ATTACHMENT
REDLINED AMENDMENT

Specification As Amended

On the first page after the title, the following was added:

--CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of copending and commonly assigned U.S. Patent Application serial number 09/107,729 now U.S. Patent 6,270,732 to Garner et al., entitled Particle Collection Apparatus And Associated Methods."--

Please substitute the following amended paragraph(s) and/or section(s):

At page 15, line 10-line 19, please replace the paragraph with the following:

The reaction systems described herein are designed for the efficient production of commercial quantities of particles. Various embodiments of high production rate reaction systems are described in copending and commonly assigned patent application serial No. 08/808,850 now U.S. Patent 5,958,348, entitled "Efficient Production of Particles by Chemical Reaction," filed on February 28, 1997, incorporated herein by reference. Alternative and complimentary embodiments are described herein.

At page 16, line 4-line 19, please replace the paragraph with the following:

Improved aerosol delivery apparatuses for reactant systems are described further in copending and commonly assigned U.S. Patent Application Serial Number 09/188,670 to Gardner et al. now U.S. Patent 6,193,936, entitled "Reactant Delivery Apparatuses," incorporated herein by reference. These aerosol delivery systems can be adapted for use in reaction systems not involving laser pyrolysis. Approaches are also described therein for the adaptation of aerosol delivery by a variety of approaches with a reaction chamber elongated in one dimension in the plane perpendicular to a reactant stream. Some of these approaches include, for example, using an elongated nozzle opening, placing columns of gas jets adjacent the aerosol nozzle, employing a plurality of aerosol nozzles and applying a combination thereof.

At page 21, line 2-line 24, please replace the paragraph with the following:

Referring to Fig. 3, an alternative embodiment of reactant delivery apparatus 102 is shown for delivery of two aerosol reactants. Aerosol generators 146, 148 deliver aerosol into delivery tubes 150, 152, respectively. Delivery tubes 150, 152 deliver reactants to two openings 154, 156, respectively. Aerosol generators 146, 148 can operate based on a variety of principles. For example, the aerosol can be produced with an ultrasonic nozzle, with an electrostatic spray system, with a pressure-flow or simplex atomizer, with an effervescent atomizer or with a gas atomizer where liquid is forced under significant pressure through a small orifice and fractured into particles by a colliding gas stream. Suitable ultrasonic nozzles can include piezoelectric transducers. Ultrasonic nozzles with piezoelectric transducers and suitable broadband ultrasonic generators are available from Sono-Tek Corporation, Milton, NY, such as model 8700-120. Suitable aerosol generators are described further in copending and commonly assigned, U.S. Patent Application Serial No. 09/188,670 to Gardner et al. now U.S. Patent 6,193,936, entitled "Reactant Delivery Apparatuses," incorporated herein by reference.

At page 47, line 29 to page 48, line 14, please replace the paragraph with the following:

A collection apparatus 520 for continuous particle collection is depicted in Fig. 33. Collection apparatus 520 includes a tank 522 and a plurality of filters 524. Filters 524 block flow paths from inlet 526 to exhaust 528. Exhaust 528 generally is attached to a pump or the like to maintain the pressure with tank 522 at desired values. Reaction chamber 530 is attached to a channel 532 that connects to inlet 526. A burst of air or a mechanical vibration is delivered to filters 524 to dislodge particles. Dislodged particles fall through valve 534 for collection in a container 536. Valve 534 can be closed to allow replacement or emptying of container 536, when it is full. A second reaction chamber 540 can be attached to collection apparatus 520 by way of channel 542. The improved collection apparatus shown in Fig. 33 is described further in copending and commonly assigned U.S. Patent Application Serial Number 09/107,729 now U.S. Patent 6,270,732 to Gardner et al., entitled "Particle Collection Apparatus and Associated Methods," incorporated herein by reference.

Claims As Amended

Please add new claims 52-62 as follows:

- 52. (New) The particle production system of claim 23 wherein the number of reactant inlets and reactant outlet are equal and each reaction chamber includes one of the reactant inlets configured to direct a reactant stream within the reactant chamber.
53. (New) The particle production system of claim 23 wherein at least one reaction chamber includes a plurality of reactant inlets configured to direct a reactant stream within the reactant chamber.
54. (New) The particle production system of claim 20 wherein the plurality of reactant inlets is two reactant inlets.
55. (New) The particle production system of claim 20 wherein the plurality of reactant inlets is three reactant inlets.
56. (New) The particle production system of claim 20 comprising a plurality of product outlets and a manifold connected to the product outlets such that the product particles are mixed within the manifold.
57. (New) The particle production system of claim 55 wherein two reactant inlets generate product particles with different compositions from each other.
58. (New) The particle production system of claim 20 wherein the collection system comprises a cylindrical filter positioned to collect a substantial amount of the product particles from the plurality of reactant inlets.
59. (New) The particle production system of claim 20 wherein the collection system comprises a tank with a plurality of filters, the tank having an inlet and an exhaust, wherein the tank inlet is connected to the one or more outlets.

60. (New) The particle production system of claim 58 wherein a manifold connects the product outlets with the tank inlet.
61. (New) The particle production system of claim 58 wherein the collection system further comprises a collection container to collect particles dislodged from the plurality of filters.
62. (New) The particle production system of claim 60 wherein the collection system further comprises a valve connecting the collection container with the tank.--